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Box 2
Item 2-26

SCIENCE-BASED ADAPTIVE MANAGEMENT AT THE BUREAU OF LAND MANAGEMENT'S LAS CIENÉGAS NATIONAL CONSERVATION AREA

STATUS REPORT MARCH 2007

PROJECT SUMMARY:

In 2004, the Bureau of Land Management entered into a cooperative agreement with The Nature Conservancy to develop a science-based adaptive management and monitoring program for the Las Cienégas National Conservation Area. This cooperative project has focused on two primary objectives: first, on the analysis of existing data on resource conditions and a review of monitoring protocols to ensure that data collection is focused on objectives established in BLM's Resource Management Plan; and second, on assisting BLM, the Biological Planning Team (BPT), and livestock permittee with integrating annual monitoring, analysis, and decision-making processes. The project was designed to be accomplished in three phases, addressing the NCA's grasslands, riparian and aquatic systems, and special status species, respectively. As of March 2007 the project is nearing completion of Phase II.

ACCOMPLISHMENTS IN BRIEF:

- BLM has effectively implemented an integrated, science-based adaptive management program focused on ensuring grassland conditions meet or exceed RMP objectives by coordinating data analyses, data reviews, and input from the BPT and permittee in advance of annual program decisions on grazing management.
- The upland monitoring program implemented since 2004 provides an improved capability to detect changes in resource conditions without increasing the cost of annual monitoring.
- BLM has fostered an environment where decision-making is based on current information and the unique public-private partnership anchored by multi-disciplinary teams has built trust among participants.
- Analysis of riparian and aquatic systems and native fish populations are underway; results of monitoring data and recommendations are scheduled to be completed by February 2007.

PROJECT OUTPUTS:

2005 State of the Las Cienégas National Conservation Area: Chapter I, Condition and Trend of the Desert Grassland and Watershed

2005 Report on the Biological Planning Process for Livestock Management at Las Cienégas NCA. Fall 2005 Upland Monitoring Results and Adaptive Management by the Bureau of Land Management, Technical Resource Team, and Rangeland Resource Team (Report summarizes monitoring results and decision-making process for the 2005-2006 annual grazing program).

2006 Joint presentation by BLM, livestock permittee, and The Nature Conservancy on upland monitoring results and adaptive management program at the Southwest Parks & Monuments Conference in Tucson. Manuscript with all authors to be published in Conference Proceedings.

2006 Joint presentation by BLM and The Nature Conservancy on the riparian habitat monitoring results and adaptive management program at the Southwest Parks & Monuments Conference in Tucson. Abstract with all authors to be published in Conference Proceedings.

2006 State of the Las Cienégas National Conservation Area: Chapter II, Condition and Trend of the Aquatic Systems and Status of Native Fish (March 2007)

2007 State of the Las Cienégas National Conservation Area: Chapter III, Condition and Trend of Riparian Systems (July 2007)

PROJECT BUDGET STATUS AND REMAINING PROJECT COMPONENTS:

The Nature Conservancy received funding in the amount of $16,000 for fiscal year 2004 to develop and begin implementation of a project work plan. Following completion of the work plan TNC submitted a proposal to BLM's Applications of Science initiative in April, 2004 for funding to implement the work plan. The total projected cost for the three project phases was $143,993 (included overhead).

Although we did not receive funding under the Applications of Science program BLM has supported the project through Challenge Cost Share funding totaling $71,342 to date (includes overhead). The Nature Conservancy has contributed $64,700 in matching funds to date, $47,000 in excess of our required match. This funding and contributed matching funds has enabled us to work through project phases I and II and we anticipate completing analyses and the Phase II report by the end of February 2007. In addition, we have responded on several occasions to needs expressed by BLM for work and deliverables that were outside of the original scope of work. For example, we jointly discovered that the existing riparian monitoring protocol would need to be expanded to address RMP objectives for cienéga habitat; second, we completed a second and third round of upland monitoring with BLM staff to reinforce the use of monitoring data in making grazing management decisions; third, we assisted in the collection of a full-round of riparian monitoring data in 2006 using existing protocols, documenting improvements in riparian vegetation since 2000 and contributing to a 16-year dataset.

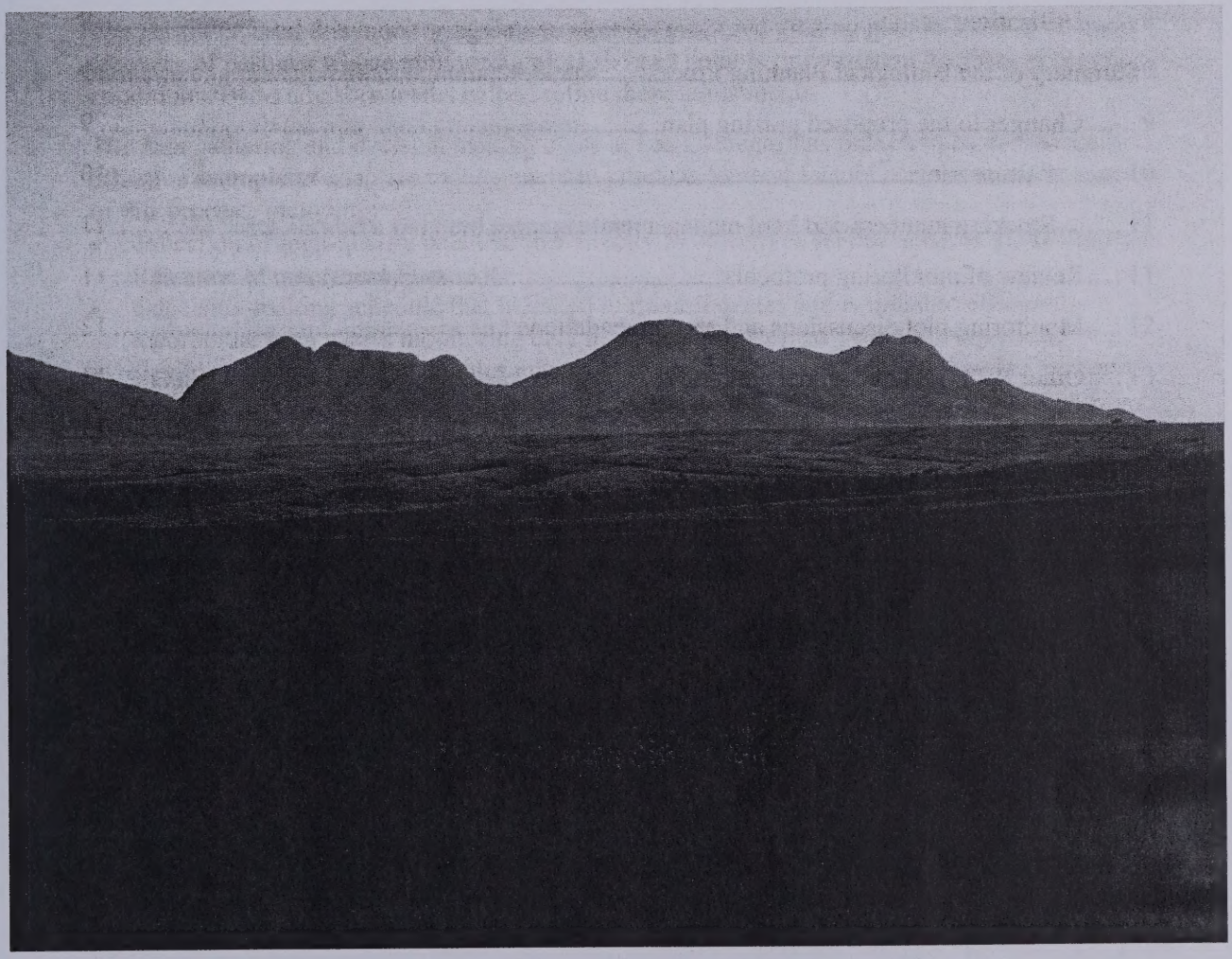
Implementing this cooperative project in phases has enabled the partnership to be flexible and to respond to needs that emerge as BLM, BPT, and TNC work through the NCA's different ecological systems and associated data and analyses. In addition, each project phase has been completed with a set of deliverables that stand on their own.

The final work plan components that remain to be completed in the third phase include analyses of population data on special status riparian species; co-location of riparian-aquatic monitoring transects to increase time-efficiency and facilitate data interpretation, a review of monitoring protocols to ensure the monitoring is focused on objectives established in the RMP, and field testing and implementation of revised protocols to obtain a full round of baseline data. The total funding from BLM required to complete the tasks associated with phase III is $57,000 (includes overhead).

Report on the Biological Planning Process for Livestock Management at Las Cienegas NCA. Fall 2005 Upland Monitoring Results and Adaptive Management by the Bureau of Land Management, Technical Resource Team, and Rangeland Resource Team.

Karen Simms, Grant Drennen, and Brad Cooper, Bureau of Land Management
Gitanjali Bodner and David Gori, The Nature Conservancy

May 2006



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Executive Summary

This report summarizes the information and processes involved in making decisions on the 2005-2006 grazing plan for Las Cienegas National Conservation Area (LCNCA). It demonstrates how the BLM, with input from its various partners and advisory teams, and the grazing permittee, is using upland monitoring data followed by pasture reconnaissance to make grazing management decisions.

Upland monitoring plots showed significant increases in perennial grass canopy cover and litter cover across the NCA. For perennial grass basal cover and bare ground cover, however, changes were less consistent, with some plots improving dramatically and others declining in these same factors. The direction of change for these factors was not affected by whether the pasture had been grazed in the past season, though this analysis did not consider intensity of use.

The permittee used this monitoring data to alter his proposed grazing plan in order to promote recovery of pastures whose monitoring plots showed notable or consistent declines in cover conditions. BLM advisory teams helped refine these adjustments.

The data gathering and decision making cycle at Las Cienegas has proven to be an unusually effective example of adaptive management in practice. Several factors contribute to the success of this process, including:

- collection of high-quality data that ties directly to objectives set out in BLM's Las Cienegas Resource Management Plan;
- a decision-making schedule that is linked to rainfall cycles and is timed to efficiently incorporate each year's monitoring data into plans for the next year's management;
- flexible management that enables managers to respond to ecosystem and market changes;
- positive working relationships between BLM, the permittee, and advisory groups; and
- active involvement of partners and community members with relevant expertise.

In addition, participants have shared a commitment to continue improving this adaptive management process. Refined monitoring protocols now more reliably document improvements in range condition, as well as catching potential problems in their early stages. A revised monitoring and decision-making schedule for 2006 should make this process even more timely. Recent development of a more detailed format for planning and tracking livestock movement will improve projection and evaluation of pasture use. With input from the advisory teams, BLM is expediting development of a plan to deal with shrub encroachment problems that are undermining the recovery of several grassland plots.

State of the Las Cienegas National Conservation Area. Part I. Condition and Trend of the Desert Grassland and Watershed

David Gori and Heather Schussman
July 2005

The Nature Conservancy
SAVING THE LAST GREAT PLACES ON EARTH

EXECUTIVE SUMMARY

The Las Cienegas National Conservation Area (LCNCA) supports three of the rarest ecosystems in the American Southwest: riparian, aquatic, and semidesert grassland; is home to 6 endangered species; and has two proposed wild and scenic river segments. Its exceptional biological, cultural, and scenic values make it a local, regional, and national priority for the Bureau of Land Management (BLM) as well as for other public agencies and organizations.

In 2004, BLM entered into a cooperative agreement with The Nature Conservancy to evaluate the current status and condition of resources on LCNCA and to review its existing monitoring protocols. This is the first chapter of a comprehensive "State of the NCA" report, focusing on the LCNCA's grasslands and savannas. Future chapters, pending funding, will address the riparian and aquatic ecosystems, target species, and stresses on these systems and species. In this chapter, we analyze and interpret available inventory and monitoring data collected at 26 key areas since 1995 to determine the condition and trend of the upland watershed as well as stresses on the system including shrub encroachment, soil erosion, loss of perennial grass cover and exotic species expansion. Nine out of 25 key areas (36%) showed significant *directional* trends in substrate cover despite low statistical power. In addition, there were many significant changes in bare ground, litter, and live vegetation cover between 1995 and 2004. These changes represented improving conditions in 35% of key areas and declining conditions in 48% of key areas. A separate analysis of overall grassland condition using 10 condition indicators indicated that 66% of key areas were *moderately* or *greatly outside desired condition* due to low perennial grass cover, shrub encroachment, and an increased potential for soil erosion. However, 74% of key areas met RMP objectives for bare ground cover and/or the Similarity Index value in 2004 or the date of last measurement.

To place these results into an ecosystem management context, we developed a state-and-transition model for semidesert grassland that identifies important thresholds in vegetation composition between model states as well as management actions capable of moving vegetation from one state to another. Few key areas (33%) fell within Open Grassland, a vegetation state that historically predominated at LCNCA while more key areas (46%) have been encroached upon by shrubs but can be restored back to Open Grassland using prescribed fire or mechanical/herbicide treatments.

Differences between key areas in overall condition appeared to be unrelated to the amount of summer and annual precipitation received over the last 4 years and the frequency and intensity of livestock use. However, the mean number of condition indicators outside of their threshold values was significantly greater for key areas located in the 12-16" precipitation zone compared to those in the 16-20" precipitation zone. Despite the lower productivity of the former sites, there was no difference in the frequency and intensity of livestock use for key areas in the two precipitation zones. In addition, key areas with low perennial grass cover that did not meet the threshold value for this indicator were grazed more intensively between 1993 and 2004 (e.g., greater number of animal days for the 12-year period) and their annual grazing intensity when

grazed was higher compared to key areas that met the perennial grass threshold. However, key areas that did not meet the threshold also had significantly greater shrub cover than key areas that met it. An analysis of 2 pairs of side-by-side key areas, one fenced to exclude livestock and the other unfenced, showed that conditions were improving on the ungrazed key areas with decreases in bare ground cover and increases in perennial grass diversity and cover compared to the adjacent grazed areas.

Together these results suggest that some combination of climate (including drought stress), site-specific factors, and livestock grazing may be driving the pattern of grassland condition observed on LCNCA. However, given the small sample size of key areas, missing precipitation data, the lack of long-term precipitation records, problems with exclosure locations and the small number of exclosures, there is considerable uncertainty regarding which of these factors, either acting alone or in concert with others, is responsible for the current condition of grasslands. Increasing the total number of livestock exclosures adjacent to unfenced key areas (which BLM is implementing) as well as increasing the power of the monitoring protocol to detect change will assist in disentangling the effects of livestock grazing, climate, and site-specific factors on grassland condition. BLM's plans to initiate a prescribed burn program to reduce shrubs and increase perennial grass cover should improve grassland condition, while their efforts to evaluate stocking levels annually in the context of current grassland condition and the drought (through the TRT/RRT process) should also help. Together, the improved monitoring information will help refine management goals for upland watersheds and identify the appropriate management actions needed to achieve those goals, both of which will assist BLM in future adaptive management at LCNCA.

BLM, with input from the Las Cienegas Technical Review Team (TRT) and Range Resource Team (RRT), used the upland monitoring data collected in 2004 to make management decisions on the proposed grazing plan for the following winter and spring. In particular, their review of the monitoring data revealed concern over two pastures proposed for use due to low perennial grass cover. In response to this concern, the lessee revised his grazing plan, decreasing by 2 months, or 50%, the total amount of time that livestock spent in these pastures. Continued success of the adaptive management process for livestock grazing management will require that the field work, analysis and interpretation of monitoring data be completed over a short time period so that it is available for use by BLM, the TRT and other teams in their evaluation of annual grazing plans. A timeline was developed to facilitate the adaptive management process for grazing management decisions at LCNCA.

Finally, we evaluated the original upland monitoring protocol and found that the sampling effort was inadequate to detect a biologically-meaningful level of change in substrate cover variables over time. Based on a series of analyses, we proposed a revision of the monitoring protocol, building on the original one and increasing its ability to detect change and to evaluate management objectives in the Resource Management Plan (BLM 2003). We tested the revised protocol with BLM in the field in 2004. This revision resulted in no net increase in the annual monitoring effort on a per key area basis and only slightly increased the effort for 5- and 10-year interval monitoring, especially if

one component of the original sampling protocol, pace frequency measurements, is de-emphasized.